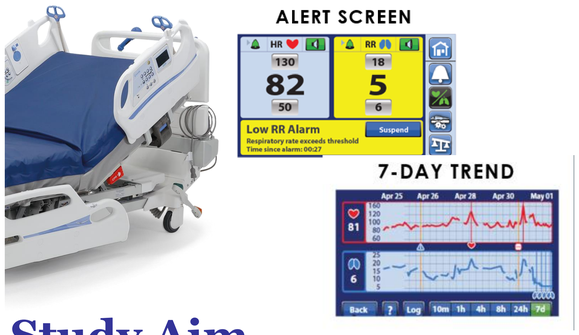
Mass General Brigham
Brigham and Women's Faulkner Hospital

The Optimized Use of a Contact-Free Continuous Monitoring System in Clinical Outcomes During COVID-19

Paula Wolski, MSN, RN, NI-BC, Alice Kim, MS, RD, Darren Scully, BSN, Calvin Franz, PhD, Stuart Lipsitz, ScD, Graham Lowenthal, BA, Matthew Wien, MS, David W. Bates, MD, MSc, Patricia C. Dykes, PhD, MA, RN

Introduction

- Usual care includes monitoring patient Vital Signs every 4 hours.
- Usual care may miss early signs of deterioration because:
  - Time between Vital Signs may miss indicators of patient deterioration.
  - Continuous monitoring of heart and respiratory rate may detect deterioration sooner.



Study Aim

This study aimed to evaluate the impact of contact-free continuous monitoring (CFCM) on the following outcomes:

- Primary Outcome: Unplanned ICU transfers.
- Secondary Outcomes:
  - ICU and overall length of Stay (LOS)
  - Rapid response % & code blue events %

Setting/Sample

- 171-bed Magnet *with Distinction*™ designated community teaching hospital in the Northeast U.S.
- Adult patients hospitalized for >24 hours in all medical and surgical units, excluding hospice patients.
- Study powered for unplanned ICU transfers per 1,000 patients.

Methodology

Study Design/Timeline

- IRB approved, Interrupted time series (ITS) evaluation of the CFCM system was conducted over 21 months.

Data collection

- Pre-implementation period of 9 months (Sept 2021 – May 2022)
- Post-implementation period of 9 months (Sept 2022 – May 2023)
- Wash-in period of 3 months (June 2022- Aug 2022)

Data Analysis

- Segmented logistic regression models to test for the probability of unplanned transfer.
- Test of statistical significance of observed changes in the unplanned ICU transfer rates in intervention (post) versus control (pre) groups.

Results

Table 2. Study Outcomes Pre- and Post-implementation of Contact-free Continuous Monitoring Bed

	PRE (N=4696)	POST (N=4694)	*P* Value
Primary Outcome			
Unplanned ICU transfer (%)	1.40	1.20	0.39
Secondary Outcomes			
Code blue (%)	0.20	0.50	0.02*
Mean hospital length of stay (days)	5.62	5.87	0.01*
In-hospital death (%)	0.70	0.94	0.24
Mean hospital LOS for patients with unplanned ICU admission (days)	12.50	13.40	0.77
RRT calls (%)	4.21	5.03	0.066

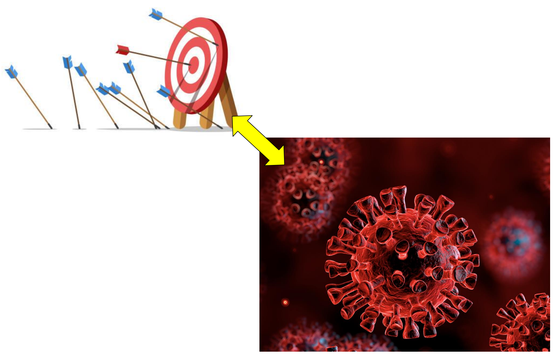
- *P* value set at .05*
- Code Blue occurrences showed a significant decrease
- Mean hospital LOS was significantly increased.
- Unplanned transfer into ICU rates were not significantly reduced (1.4% vs 1.2%, *p*=0.39). However, there was a 14% reduction in ICU transfers.

Discussion

*Historical events can be a threat to the research process. Unanticipated consequences emerged during the pandemic that may have influenced the study outcomes.

Limitations of this study may be related to the impacts of COVID-19:

- Increased hospital capacity
- Lack of long-term care beds for discharge
- High staff turnover rate



Implications

- This technology could be beneficial in recognizing deterioration in facilities with a high baseline transfer to ICU.

Recommendations

- This study may be easily reproduced.
- Conducting larger randomized controlled trials in other healthcare settings may limit confounding variables from this study.

Contact Information

pwolski@bwh.harvard.edu

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